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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,440	08/27/2001	Jae-Ryung Lee	EF 321682639US	3995

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BAKER & BOTTS
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER
UHLIR, NIKOLAS J

ART UNIT	PAPER NUMBER
1773	5

DATE MAILED: 06/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

14-5

Office Action Summary	Application No.	Applicant(s)	
	09/914,440	LEE ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☒ Claim(s) 1-9 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Copy of WO98/45114* .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities: There are numerous misspellings present throughout the specification. Examples include the term "tefron," which first appears on page 3, line 17 (and throughout the specification and claims) is misspelled. "Tefron" should be re-written "Teflon." In addition, the term "urethan," which first appears on page 3, line 17 (and throughout the specification and claims) is misspelled, and should be re-written as "urethane."

Appropriate correction is required.

3. Although no trademarks are currently disclosed due to incorrect spelling, correcting these errors will result in the trademark "Teflon" being used in this application. The applicant is reminded that trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. The examiner suggests "polytetrafluoroethylene," abbreviated "PTFE" as a suitable generic term for Teflon.

4. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

5. Claims 1-9 are objected to because of the following informalities: Claims 1-9 require a "urethan" resin and a "tefron" based wax. These terms are misspelled and should be re-written "urethane" and "polytetrafluoroethylene." Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4, 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the instant case, the claims recite the limitation of a plate-type metallic powder, wherein the powder has a particle size between .5-5μm. It is unclear to the examiner whether the particle size specified is an indication of the major or minor dimension of the particle. In the art, a plate or flake type particle is commonly referred to as having a major dimension, referring to the length of the flake along its longest axis and a minor dimension, referring to the length of the flake along its shortest axis. It is unclear to the examiner whether the applicant is requiring the major dimension of the flake to be the required size, or the minor dimension. Clarification is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata et al. (WO98/45114) in view of Pfeil et al. (US5612394).

10. For the purpose of this examination the examiner has relied upon US Patent #6235407B1 as an English translation of the Japanese PCT WO98/45114. The applicant is advised that all references to Ogata et al. are directed towards the US reference.

11. Further, for the purpose of this examination, the examiner has interpreted the particle size required by claims 4, 8 and 9 to refer to the average minor dimension of the plate type particle.

12. Ogata et al. teaches a steel plate for a highly corrosion resistant fuel tank. This fuel tank comprises a steel sheet that has been coated on each side with a layer of Zinc (Zn), a chemical conversion layer deposited on each layer of Zn, a metal powder containing organic resin film deposited on one of the conversion layers, and a resin layer that contains silica and a lubricant deposited on the other conversion film (column 3, line 61-column 4, line 8). The chemical conversion layer is preferably a chromate, zinc phosphate, or Iron phosphate film (column 5, lines 33-40). The resin used in the metal powder containing organic resin layer is typically an epoxy or phenoxy resin that has been modified with a primary or secondary amine. The amine is added to ensure good adhesion with the chemical conversion film and the metal powder (column 8, lines 50-67). Ogata et al. teaches that the amount of amine added to the epoxy/phenoxy resin is between .2-1 mole per 1 equivalent of the oxyrane ring in the epoxy/phenoxy. If

less than .2 moles of amine is added, the affinity between the metal powder and the amine modified phenoxy/epoxy is insufficient, whereas if more than 1 mole of amine is added, the film will absorb moisture from the atmosphere thus leading to a decrease in corrosion resistance (column 9, lines 1-27). Thus, the examiner takes the position that the amount of amine added to the epoxy is a results effective variable, and it would have been obvious to one with ordinary skill in the art to optimize the amount of amine added to the range specified, specifically 2-15phr, in order to achieve a desired level of modification and H_2O absorption. Further, Ogata et al. teaches that the molecular weight of the amine-modified phenoxy/epoxy has an effect on the resultant properties of the film. If the molecular weight of the amine-modified phenoxy/epoxy is too low, the film exhibits poor toughness, whereas if the molecular weight is too high, the affinity between the metal powder and the resin is insufficient (column 9, lines 41-54). Thus, the examiner takes the position that the molecular weight of the amine modified epoxy/phenoxy resin is a results effective variable, and it would have been obvious to one with ordinary skill in the art at the time the invention was made to optimize the molecular weight to the range specified, specifically to a number average molecular weight between 25-50 thousand, in order to achieve a desired coating toughness and affinity between the resin and the metal powder. The metal powder added to the amine modified epoxy/phenoxy resin is typically selected from nickel (Ni), aluminum (Al), iron (Fe), and copper. Ni and Al are preferred due to their flaky configuration, which prevents corrosive ions from permeating through the organic film (column 7, lines 1-18). If aluminum is used, it is preferable in flake form with an average minor diameter of 1-10

μm (Column 7, lines 35-42). Thus, the particle size limitation required by claims 4, 8 and 9 is met. The amount of metal powder added is typically between 30-110 parts by weight, based on 100 parts by weight of the resin (column 7, lines 60-65). The metal containing organic film is typically coated to a thickness of 2-10 μm on the surface of one of the chemical conversion layers (column 10, lines 1-3). In addition, the metal powder containing organic resin film can contain additives such as a lubricant, a pigment, a thixotropic agent, a dispersant, or the like (column 10, lines 10-14). This metal containing organic resin is applied to the conversion coating via roll coating, and baked and dried at 150-300^{0}C (column 13, lines 20-25). Ogata et al. teaches that the base resin used to coat the other chemical conversion layer should have at least one functional group selected from hydroxyl groups, isocyanate groups, carboxyl groups, glycidyl groups, and amino groups. Examples of such resins include epoxy resins, alkyd resins, acrylic resins, urethane resins, polyvinyl butyral resins, phenol resins, melamine resins, and the like (column 10, lines 35-43). Colloidal silica is blended into this resin for the purpose of providing corrosion resistance (column lines 50-62). Typically 5-80 parts by weight of colloidal silica is added (column 12, lines 30-48). Further, a lubricant is blended into the silica containing resin to produce a film that can endure press working (column 11, lines 6-24). This lubricant has an average particle size of 1-7 μm (41-45). Ogata et al. specifically cites polytetrafluoroethylene as a suitable lubricant (column 14, lines 37-40). The amount of lubricant added is typically 1-40 parts by weight (column 12, lines 49-53). The silica containing organic resin film typically has a thickness between

.5-1.5 μm (column 12, lines 19-21). The silica containing organic resin film is applied to the conversion layer and is baked and dried at 50-180^{0}C (column 13, lines 45-50).

13. Ogata et al. does not teach a coating a fuel tank, wherein coating comprises a phenoxy resin having a number average molecular weight between 25-50 thousand, 2-15phr of melamine resin, 10-20phr of colloidal silica, 2-10phr of a Teflon based wax, and 5-70phr of a plate type metal powder having a particle size between .5-5 μm, and the dried coating thickness is between 1-10 μm.

14. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to add 1-40 parts of a lubricant such as polytetrafluoroethylene, and 5-80 parts of colloidal silica to the metal pigment containing organic layer taught by Ogata et al.

15. One would have been motivated to make this modification for the following reasons. Ogata et al. teaches that the metal containing organic resin layer can contain additives such as a lubricant. Later, Ogata et al. teaches adding polytetrafluoroethylene wax to an epoxy resin in order to improve the lubricity and press workability of the film (column 10, lines 10-15, and column 11, lines 5-25). Ogata et al. also teaches adding colloidal silica to an epoxy resin for the purpose of improving corrosion resistance (column 10, lines 44-49). Thus, because both silica and polytetrafluoroethylene wax are taught to be added to the same type of resin as used in the metal containing organic resin layer, and the benefits thereof are clearly shown, there is motivation to add these fillers to the metal containing organic resin layer.

16. Ogata et al. does not teach using melamine as the primary/secondary amine used to modify the epoxy/phenoxy resin.

17. Pfeil et al. teaches coating compositions for coating the interior of containers, such as foodstuff and beverage containers (column 1, line 5-10). Pfeil et al. teaches in the background that suitable coatings which have good adhesion to steel, tinplate, and other conventional container materials have been formed from high molecular weight epoxy resins in combination with an appropriate amount of curing agent such as a melamine or guanamine resin (column 1, lines 17-45). Melamine is a known compound consisting of three primary amine (NH_2) groups, situated *Meta* to one another on a triazine ring.

18. Therefore it would have been obvious to one with skill in the art to use melamine as the primary amine used to modify the phenoxy/epoxy resin taught by Ogata et al.

19. One would have been motivated to make this modification due to the teaching in Pfeil et al. that high molecular weight epoxies modified with melamine exhibit good adhesion to metals such as stainless steel, the teaching in Ogata et al. that a primary or secondary amine is used to modify the epoxy/phenoxy resin used, and the fact that melamine is a known primary amine compound.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

nju
May 28, 2002

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700